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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/620,068  
Filing Date: July 15, 2003  
Appellant(s): CHANG ET AL.

**MAILED**  
**NOV 27 2007**  
**GROUP 1700**

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Michael Morra  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 31 October 2007 appealing from the Office action mailed 12/08/2006.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

No amendment after final has been filed.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**WITHDRAWN REJECTIONS**

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner. The rejection based on 35 USC 102 (b) - anticipation.

**(7) Claims Appendix**

A substantially correct copy of appealed claims 1-8 and 10 appears on pages 12-13 of the Appendix to the appellant's brief. The minor errors are as follows: Claim 2 has a portion in brackets. It is clearly an artifact from the amendment of 10/10/2006 - it does not effect the scope of the claim.

**(8) Evidence Relied Upon**

5,287,427	ATKINS	2-1994
5,478,371	LEMAIRE	12-1995

www.everythingw.com definition for "room temperature", 2 September 2005

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-8 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "room temperature" (claim 1, line 9) is indefinite as to its meaning. As per the everything2.com website reference, "room temperature" can be from -10 C to 50 C. However, it also indicates that physicists go by the narrow range of 21-23 C. One of ordinary skill would not be able to ascertain what temperatures read on the claims and which would not. Appellant's specification gives no indication or examples as to what temperatures do or do not read on "room temperature".

More importantly, since Lemaire 5478371 teaches 50 C treatment (col. 4, line 18). Atkins also teaches the use of 50 C (col. 3, line 60). It is a germane question as to what the term "room temperature" might encompass 50 C.

The phrase "to limit any future hydrogen-aging increase" is indefinite as to whether it means that it limits at least one increase – or that it means that there is no manner in which there can be such an increase.

See Allen Eng'g Corp. V. Bartell Indus. Inc. 299 F.3d 1336, 1348, 63 USPQ2d 1769, 1775 (Fed. Cir. 2002) (quoting Personalized Media Communications, LLC v. Int'l Trade Comm'n, 161 F.3d 696, 705, 48 USPQ2d 1880, 1888 (Fed. Cir. 1998)) ("In determining whether the claim is sufficiently definite, we must analyze whether "one skilled in the art would understand the bounds of the claim when read in light of the specification.") See also, Exxon Research & Eng'g Co. v. United States, 265 F.3d 1371, 1375, 60 USPQ2d 1272, 1276 (Fed. Cir. 2001) (citation omitted) (patent claims must be "sufficiently precise to permit a potential competitor to determine whether or not he is infringing").

Claims 1-8 and 10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There is no support for the new claim 1 limitation "to limit any future hydrogen-aging increase in transmission loss...." Whereas it is clear that there is support limiting some future increases, there is no support for limiting all possible future increases. The plain reading of the claim is that it requires that it is impossible to increase the loss beyond 0.04 db/km. Just because applicant used the fiber in a particular environment for a particular length of time and got a loss increase that was no more than 0.04 db/km, it does not reasonably follow that one of ordinary skill would have considered that applicant had possessed the concept that the fiber could not have a greater loss - irrespective of its future, for an extreme example, in 300 atm of hydrogen, at 800 C for 40 years.

***Claim Rejections - 35 USC § 103***

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atkins 5287427 or Lemaire 5478371.

Atkins is applied first:

1. A method for making optical fiber,

See col. 2, lines 54-56 of Atkins.

**the method comprising the steps of: forming a glass core rod by soot deposition,**

This is not explicitly taught by Atkins. However, from col. 3, line 39-42, and else where, it is clear that the invention is directed to conventional fibers. One of ordinary skill would immediately infer from Atkins that a glass rod was formed by soot deposition.

From MPEP 2144.01 Implicit Disclosure:

"[I]n considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom." *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968).

See also, *In re Fritch*, 972 F.2d 1260, 1264-65, 23 USPQ2d 1780, 1782-83 (Fed. Cir. 1992); *In re Sovish*, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir 1985).

One would infer this because it is well known that substantially all (if not all) commercial silicate fibers were made by forming a glass core rod by soot deposition. Appellant has not disputed this inference.

**the glass core rod having a core region surrounded by a cladding region;**



Likewise one would infer this limitation: the cladding maintains the light signal in the fiber. Appellant has not disputed this inference.

**dehydrating the glass core rod;**

Likewise, one would immediately infer the rod was dehydrated, water begets OH which is a problematic impurity. Appellant has not disputed this inference.

**consolidating the glass core rod to form an optical fiber preform;**

This too is immediately inferred by those of ordinary skill.

**drawing fiber from the optical fiber preform,**

This too is immediately inferred.

All of the above limitations are implicit in the Atkins disclosure. This is undisputed. Applicant also discloses such steps are convention beginning at [0003] of the specification.

**wherein the drawn optical fiber has a transmission loss at 1385 nm that is less than 0.33 dB/km;**

Atkins does not disclose this limitation, but it is clear that the wavelength of 1385 nm is substantially disclosed at col. 7, lines 58 and elsewhere (i.e. 1.39 microns). It would have been obvious to have the loss as low as possible, because the more loss means the weaker the signals over long distances - thus requiring more boosters to boost the signal

**and exposing the drawn optical fiber to an atmosphere containing deuterium at room temperature,**

See col. 6, lines 54-60 of Atkins which discloses exposure to hydrogen at room temperature. Hydrogen gas inherently comprises 0.015% of the deuterium isotope. This is undisputed

**wherein the partial pressure of deuterium is between approximately 0.01 and 0.05 atmospheres,**

The pressure of Atkins pressure is disclosed to 208 atm. Thus, the 0.015% deuterium would have a partial pressure of  $208 \text{ atm} \times 0.00015 = 0.0312 \text{ atm}$ .

**and wherein the drawn optical fiber is exposed to the atmosphere containing deuterium for a time period that is sufficient to limit any future hydrogen-aging increase in transmission loss at 1385 nm to less than 0.04 dB/km.**

It is deemed that it is inherent that there would be any number of future hydrogen-aging increases in transmission loss – assuming that there ever were hydrogen aging. For example, it is presumed that one second into the future, that any loss would be less than 0.04 dB/km. But even hydrogen could age it that quickly, then after 0.1 second, or 0.01 second or less, one could find at least one future loss that is less than 0.04 dB/km. Atkins has a loss of 0.3 dB/cm (at col. 7, line 60); this is 30,000 dB/km. An increase of 0.04 dB/km compared to 30,000 dB/km is rather insignificant.

The broadest reasonable interpretation of “any future hydrogen-aging increase” is that it encompasses ANY future increase – no matter how small, no matter when it occurs and irrespective any concrete starting point or finishing point. In other words, it can also encompass an increase of any arbitrary duration (for example 3.6 picoseconds), of any arbitrary start time. There is nothing in the specification which would suggests that the claim language should be interpreted as excluding arbitrary durations or start times.

It is noted that the term “deuterium” has been interpreted to encompass HD (i.e. a molecule of protium and deuterium) as well as D<sub>2</sub>. This interpretation remains undisputed.

Claim 2: Atkins 187 atmospheres at 6 days (col. 4, line 27) would have 0.028 atm. of naturally occurring deuterium. 0.028 is deemed to be “approximately 0.01”. This is

undisputed. Alternatively: it would have been obvious to use whatever pressure is necessary to get the particular effect is desired by the Atkins process – and what equipment one has available. One would understand that one could use a lower pressure for a longer time – if one did not have a vessel which could handle such a high pressure. It is noted that hydrogen (flammable) at high pressures presents certain safety issues and motivation to use a lower pressure.

Claim 3: Based on applicant's specification at [0032], this is inherently met: Appellant treats with hydrogen to remove defects. The fact that appellant uses another isotope would not change this. It remains undisputed that SiOH and SiH are not defects: see for example the bottom of page 6 of the 06/06/06 Office action.

Claims 4-8: all these limitations are immediately inferred from Atkins.

Claim 10: it would have been obvious to use whatever time and pressure is necessary to get the fiber properties desired for the final product, depending upon what the starting properties of the fiber are. Clearly a smaller fiber would need less pressure or less time. A larger fiber diameter would require more.

Lemaire is applied in substantially the same fashion as Atkins. Namely, most of the limitations regarding the creation of the fiber are immediately inferred by one of ordinary skill. It is substantially the same as when one infers chlorine when the term "halide" is used. Or that disclosure of a method of making furniture would cause one to immediately infer that a tree was chopped down. There is no certainty that a tree was

chopped down, but rather it is such a conventional nature, that one does not bother mentioning it. It is well understood that the Office often encourages inventors to not to bother with the clutter of describing the conventional aspects of a method - such as the present forming, dehydrating, consolidating, and drawing steps. Appellant has not disputed such steps would be inferred from Lemaire; such being described as conventional by appellant starting at [0003].

As to the exposing step: see col. 4, lines 12-24 of Lemaire. The 440 atm of hydrogen would result in about 0.066 atm of the naturally occurring isotope. 50 C is deemed to be encompassed by "room temperature" as indicated by [www.everything2.com](http://www.everything2.com).

The dependent claims are met in the same manner as with Atkins. However with claim 10: it is deemed 0.066 atm is "approximately 0.05". And "approximately 1.5 days" reads on (or is obvious in view of) the "about 3-4 days" of Lemaire.

#### **(10) Response to Argument**

Applicant points out that the 102 rejection is not appropriate because Atkins does not explicitly disclose the 0.33 dB/km loss limitation. This is correct. This rejection is presently dropped. However this limitation would have been obvious, so as to have as low a loss as possible in the commercial fiber.

It is also argued that Atkins treatment of 208 atmospheres of hydrogen will have an affect that is opposite as to what is required by claim 1, because the Atkins glass has loss of 10 dB/km. Appellant is mistaken, it is clear from col. 7, line 37 that this 10 dB/km glass relates to a glass plate, and not optical fiber. One of ordinary skill would not translate the plate properties to fiber properties as follows: From col. 1, lines 51-55 of Atkins, the prior sensitization is "inconvenient" in optical fibers. And from col. 2, lines 15-22 Atkins distinguishes between writing in an optical fiber, and writing in planar glass layer; it is clear these are two different embodiments. One of ordinary skill would immediately realize that a loss of 10 dB/km means that light would have a loss of 90% of the signal over a 1 km length. This would not seem to be a very marketable fiber. In particular the passage that appellant refers to also refers to losses in the 0.1 dB/ cm to 0.01 dB/cm range (Atkins, col. 7, lines 67-68). A loss of 0.01 dB/cm corresponds to a loss of 100 dB/km – which (if Examiner's math is correct) means over the length of a mere 1 km, 99.9999999% of the signal would be lost. Examiner doubts any silica fiber with such a high loss has a marketable value. If the 100 dB/km loss does not reasonably translate, then it is doubtful that one of ordinary skill would assume the any part of the range (10-100 dB/km) for planar devices should be inferred/translated to be applicable to fibers. Since Atkins make no suggestion of using a fiber with 10 dB/km loss; and it does not seem reasonable to conclude that one would translate the loss of the planar waveguide to the loss in a conventional fiber. In other words: Examiner understands that there is a prima facie assumption that the high starting loss in the plate would translate to a high starting loss in all of the embodiments. However, that it is a

refutable assumption. Examiner refutes this by pointing that such would require one to believe that AT&T had a conventional fiber with a loss of 99.9999999% for a 1 km length. This seems highly unlikely. Appellant's assumption is not reasonable.

It is also argued that with Atkins hydrogen will primarily fill the Si-defect sites. This is not very relevant because claim 1 does not require any Si-defect sites be filled.. Claim 3 does requires such, however it does not preclude hydrogen from filling the defect sites - it requires a reduction, but it does not specify the reduction mechanism/reaction. As indicated in the rejection, hydrogen fills the defect site.

It is also argued that Atkins has a loss which is greater than Appellant's recited loss of 0.37 dB/km. This is not understood because the claims do not recite any value of 0.37 dB/km.

It is also argued that claim 1 requires that after deuterium exposure, optical transmission loss be less than 0.37 dB/km. Examiner disagrees. The claim requires that the drawn fiber have a loss that is less than 0.33 dB/km; but it puts no constraints as to what the loss is after the exposing step. Although the claim requires that the exposing step is such that a "future" loss increase is less than 0.04 dB/km, the claim does not preclude any loss increase during the other process steps (i.e. prior to the start of the "future"), nor does the claim make an indication as to when the "future" begins. A plain reading would be that the future is in reference to the termination of the exposing. For example, one could have a fiber with a loss of 0.30 dB/km, then increase the loss by 2.0 dB/km, then expose the fiber in manner that the loss increases a further 5 dB/km, then after the exposure there is only a 0.01 dB/km future increase. Thus the fiber would

have a total loss of over 7 dB/km and still read on the claim. In other words: the claim is comprising in nature and thus is open to other steps, including steps which increase the loss by any amount – provided that they do not occur in the “future.”

Appellant makes the same arguments regarding Lemaire. They are not convincing for the same reason. Namely, the claim only refers to the loss when the fiber is drawn, and an increase that occurs in the future. The claim is comprising in nature and thus is open to having any additional loss between the drawing and the future.

At paragraph spanning pages 5-6 of the Brief, Appellants disagree with Examiner's position because it would be a bizarre thing to do to expose the fiber to extraordinary levels of hydrogen in a situation where low transmission loss is desirable. Examiner presumes that since AT&T/Lemaire pursued a patent on the invention, that they did not think it was so bizarre. As per col. 4, line 66 of Lemaire – the exposed length was only 25 mm. Figures 4-5 show a maximum loss increase of about 0.22 dB/mm. This corresponds to a total loss of 5.5 dB. Moreover, Atkins pursued a patent for a device for that had a corresponding loss of 30 dB/cm (or 3.0 dB/mm which is more than 10 times the loss of Lemaire's figure 4). The evidence clearly suggests that making an optical device with the loss that Lemaire has, would not be bizarre. It is easy to understand that loss is very important for transmission over 100's of kilometers, it is not as important when it is an active fiber device that is only a few centimeters in length.



It is also argued that claim 1 clearly requires that the loss be forever less than 0.37 dB/km. The claim does not make such a requirement. Nor does the specification disclose this. Nor would this seem to be definite or enabled (if it were added to the claim) - it would probably require a time-machine to make sure the loss remains low "forever".

Further it is argued that both Atkins and Lemaire both disclose that AT&T's fiber is about 10 dB/km. Examiner could find nothing to support this assertion, nor does Appellant point out where this disclosure is in the reference - by page and line number. As pointed out above, Appellant only points out this high index for a small planar device, not a fiber.

It is still further argued that one would never expose a fiber to the Atkins or Lemaire atmosphere because it would cause a loss of 10,000 dB/km. Examiner disagrees. See Lemaire, col. 4, lines 22-23 which discloses that the hydrogen diffuses out over the course of several days, if it isn't heated, clearly any increase of the loss is reversible, except for the portion that is heated to make permanent. Only region 13 is heated (figure 2, col. 3, lines 49-51). One would immediately infer that only the small region (25 mm section as per col. 4 line 66 of Lemaire) has any permanent effect of increased refractive index. If anything, Lemaire has a *decrease* of 10,000 dB/km for most of the fiber – this clearly suggests the total future loss is NOT increased - because it decreases.

As far as Examiner can tell, it remains undisputed that it would have been obvious to have the drawn/conventional fiber have as low of loss as possible as set

forth in the rejection. Thus even if one does infer that the high loss of the prior art plates would translate to high loss in the Atkins/Lemaire fiber, it would have been obvious to reduce that loss to be as low as reasonably possible – so as to reduce the loss of all portions not included in the 2.5 cm exposed portion.

**112 - 2<sup>nd</sup> paragraph arguments**

The arguments regarding the definiteness of “si-defects” are moot; that portion of the rejection is not maintained.

It is argued that there does not appear to be any meaningful confusion among physicist and chemists, because examiner's evidence indicates that physicists consider it to cover 21-23 C, and chemists use it to describe temperatures "slightly warmer". Examiner disagrees, this suggests that there would be an issue between physicists and chemists. It seems to suggest that a physicist might practice Appellant's invention at 24 C to avoid infringement, because to her, it is not “room temperature.”

It is further argued that the everything2.com reference does not disclose that -10 C and 50 C are not what one of ordinary skill would consider to be a 'normal' room. This does not appear to be relevant. The claim does not specify a 'normal' room temperature. The specification gives no description or examples that serve to identify what applicant meant by the term. The second to last paragraph of the

everything2.com website says "Realistically, a household room could be..." -10 to 50 C.

To examiner, a household room IS a "normal" room.

Appellant further argues that the temperature is generally understood to cover the range 20 to 25 C. But then Appellant then refers to evidence that indicates it means 16-27 C (see Brief, page 9, line 14). It would seem that a potential infringer would be very confused as to whether 27 C would or would not read on the claims.

Examiner also notes that the second paragraph of the everything2.com reference indicates that it means there was no effort to control the temperature - thus this might suggest that it could be any temperature.

#### Any Future Hydrogen-Aging

It is argued that claim 1 requires that the 0.04 dB/km increase applies to the entire lifetime of the optical fiber. Applicant refers to [0030] and asserts that it states that the loss refers to the increase in loss during the lifetime of the optical fiber – and its lifetime begins before deuterium treatment. Examiner disagrees because the relevant passage state that it "is caused, e.g., by the chemical reaction between hydrogen and various defects in the optical fiber during the lifetime of optical fiber". Appellant's use of the term "e.g." indicates that such is merely an example and thus not limiting.

Moreover, any increase that occurs one second after the exposure does would be "during the lifetime of the optical fiber".

It is also argued that the claim encompasses a period of 40 years. Examiner could see nothing to support this. There is nothing in the record which remotely suggests that applicant performed a 40 year test on the fiber.

35USC 112 (1<sup>st</sup>)

It is argued that the written description requirement is complied with because it should be understood that the term "any future hydrogen aging increase in transmission loss" encompasses the most severe environments in which optical fibers are designed to operate, but not those that are beyond the realm of commercial experience. Applicant fails to give any rationale to support this assertion. One of ordinary skill would never understand the claim to mean that, because that would require one to assume that they could copy Appellant's invention exactly, except to design it for an experimental (rather than commercial) usage at 9000C - or some other temperature which would create a loss of, say 0.1 dB/km, merely because it did not maintain the low loss in an environment for which it was 'designed to operate.'

To the degree that "any future" doesn't really mean "any" future, but only those of within the realm of commercial experience: the specification fails to provide support for this "commercial experience" limitation as required by 35 USC 112 (1).

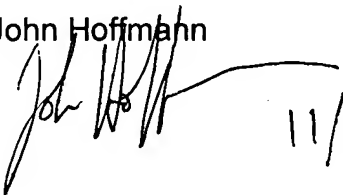
**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

John Hoffmann



11/26/07

Conferees:

Steven Griffin 

/Romulo Delmendo/

Romulo Delmendo , Appeal Conferee